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Assessment of Incineration as a Treatment Method for Liquid Organic Hazardous Wastes Background Report 5. Public Concerns Regarding Land-Based and Ocean-Based Incineration

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Assessment of Incineration As A Treatment Method for Liquid Organic Hazardous Wastes

Background Report V: Public Concerns Regarding Land-Based and Ocean-Based Incineration

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In general, ocean incineration has caused a greater degree of public opposition than most land-based incinerators. This is primarily because the perceived impact of land-based incineration is very localized, whereas ocean incineration is thought by some citizens to potentially affect an entire region: the port community, all the communities along the coastline near the burn site, and the marine environment. While the source of opposition to both ocean and land incinerators has been primarily from local communities, ocean incineration is unique in also being actively opposed by some multi-state coalitions of civic, business, and environmental groups, and by some national environmental groups.

The immediate impact of citizen opposition has been to impede the siting of land incinerators and of port facilities for ocean incinerator ships and to delay the issuance of permits for conducting burns on land and at sea. The long-term effect of continued opposition may make it difficult to develop further incineration capacity.

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PUBLIC CONCERNS REGARDING

OCEAN AND LAND-BASED INCINERATION

March 1985

A background report for the study by
EPA's Office of Policy, Planning and
Evaluation: "Assessment of Incineration
As a Treatment Method For Liquid Organic
Hazardous Waste."

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EXECUTIVE SUMMARY

Incineration is a waste treatment technology which EPA believes offers advantages over many existing waste management practices, and may help to meet the anticipated need for greater treatment and disposal capacity for managing hazardous waste in the near future. However, public opposition to the permitting of new incineration operations has been strong in recent years, beginning in about 1980. In response to the dilemma of perceived benefits versus public concerns, EPA initiated an agency-wide assessment of incineration to see whether there was any new information indicating a need to change the Agency's approach toward regulating incineration.

One of the tasks for this assessment of incineration was to pull together in one document the major issues being raised by concerned citizens. The focus of this task was to answer the question: what are citizens' attitudes and concerns that affect the siting and permitting of incineration facilities? This was not a survey of general public opinion on incineration, but rather a study which cataloged the concerns reported by a sample of those already opposed or at least involved in the issue.

Major Findings

1. There has been public concern about, and some very vocal opposition to, the siting and permitting of both land-based and ocean incineration. For both types of facilities the core of opposition has come from local citizens, and this local opposition has included environmental groups, civic associations and local government officials.

2. Ocean incineration has generally involved a greater degree of public concern and opposition than land-based incineration. Opposition to ocean incineration has been regional in scope, coming from local communities in a multi-state area along the Gulf of Mexico, and has also involved a few national environmental groups. Many people concerned about ocean incineration are not completely against a regulatory program that allows ocean incineration, but they do want significant safeguards built into the regulations and permits.

3. The amount of public opposition to proposed permits for land-based incinerator facilities has varied by location and type of waste. On-site facilities that directly serve a single waste generator have greater public acceptance than off-site, commercial incinerators that serve multiple generators in a large market area. Many people feel that off-site facilities do not provide sufficient economic benefits to the local community to offset the risks associated with the importation of

wastes from other areas. On-site facilities are more clearly perceived as being linked to businesses that are important to the local economy, and are generally not perceived as being importers of hazardous waste. Opposition has tended to focus primarily on new off-site facilities, which share many similarities to incinerator ships; and on new applications to burn PCBs, which critics view as particulary hazardous.

4. Major concerns reported by citizens opposed to incinerators are the following:

   - Concern for potential spills of toxic substances on land and water during transport, storage, and handling activities.
   - Concern for potential environmental impacts at sea and health impacts on land from incinerator air emissions.
   - Concern that the process of selecting sites for incinerator facilities is not clearly defined, and that local citizens do not have a role in this decision.
   - Concern that incinerator companies are not dealing "openly" with the public when providing information about their facilities and activities.
   - Concern that federal and state regulatory agencies lack sufficient resources or commitment to maintain effective permitting, monitoring and enforcement programs.
   - Concern that the ocean is a special "public resource" that needs special protection.
   - Concern that there is insufficient data available on the potential impacts of incineration on the marine environment on which to base a regulatory program for ocean incineration, and that the ocean incineration regulatory program has been poorly managed by EPA in the last few years.
   - Concern that regulation of ocean incineration needs to be clearly linked to a national strategy for hazardous waste management.

Issues and Conclusions

This study identifies several key underlying issues that may have been acting as barriers to public acceptance of incineration as a waste treatment method. Those underlying issues not already reflected in the concerns summarized above are:

- Dissatisfaction with the public hearing process,
- Heightened public fears regarding hazardous waste disposal, and
- Lack of public acceptability of risks from pollution.

Of these three issues, perhaps the most important one is the dissatisfaction with the public hearing process, due to differences in perspectives, expectations, and concerns brought by citizens and regulatory officials to this principal forum for communication.

In hearings on proposed permits, the primary focus of the EPA staff is on compliance of the proposed permit with regulations and incinerator performance standards. This is because EPA officials accomplish the job of protecting health and the environment through diligent application of regulations and standards. Federal and state regulatory agencies expect to discuss technical issues at hearings, and are often perplexed by both the vehemence of public concerns and the broad range of issues raised by citizens. Government regulatory officials have already carefully evaluated a company's proposal in terms of its adequacy in meeting technical and administrative requirements. Company officials, in turn, present technical studies to show that the proposed facility meets all regulations.

The public, on the other hand, is often concerned about broader or nontechnical issues, such as site selection, local economic impact, enforcement plans and capability, company credibility and potential health risks. Most of these issues are ones that either EPA believes were resolved prior to the proposed permits (e.g., that incineration is an environmentally sound technology), or that EPA has no jurisdiction over, such as the siting of land-based incinerators. Likewise, the incinerator company's past performance record, while of serious concern to EPA, does not preclude the granting of a permit as long as all conditions and requirements of the regulations are met.

This problem of differing perspectives indicates that citizens often do not understand that the scope of permit hearings is limited to the proposed permit, that technical requirements reflect underlying concerns for protecting health, and that other activities such as transportation are controlled by different regulations. This lack of public understanding or differences in perspective may indicate a need for regulatory agencies to provide a better explanation of the overall regulatory framework for controlling hazardous waste.

The basic conclusion of this study is that EPA needs to better address the concerns of citizens regarding incineration by:

1. taking actions to ensure maximum protection of health and the environment; and

2. improving its public communication efforts and providing more visible leadership in the area of hazardous waste management.

Public opposition to both land and ocean incineration may decline somewhat if EPA addresses more fully some citizen concerns regarding national regulatory strategy, local community impacts, equity of facility siting, public decision-making processes, and especially enforcement plans and capability.

Clearly many of the public's concerns are also EPA's concerns, such as the potential health and environmental impacts from incineration. But the Agency needs to better communicate how health and environmental concerns and priorities are reflected in the Agency's regulations and standards. Better communication of EPA's overall regulatory policy, strategy, and activities for hazardous waste management is crucial in providing a context for decisions on proposed permits for individual incinerator facilities or vessels. Better public communication is also important for improving EPA's credibility with the public, which is a necessary foundation for the effective accomplishment of the Agency's mission.

I. INTRODUCTION

Incineration is a waste treatment technology which EPA believes offers several advantages over some other existing waste management practices, and may help to meet the anticipated near-term need for greater treatment and disposal capacity for managing hazardous waste. However beginning in about 1980, there has been growing public opposition to the permitting of new incinerator facilities for treatment of hazardous wastes, particularly for ocean incineration. Most if not all of the concerns raised about ocean incineration in the last few years had also been raised during the period from the first proposed permit in 1974 to about 1980, and these concerns were satisfactorily responded to by EPA management personnel at that time. However essentially the same concerns have now been raised again by different citizen groups that were not involved during the earlier period.

In response to the dilemma of perceived benefits versus renewed public concerns, EPA's Deputy Administrator requested in early 1984 an agency-wide assessment of incineration to see whether there was any new information indicating a need to change the Agency's approach toward regulating land-based or ocean incineration. One of the tasks for this assessment was to summarize citizens' concerns about incineration.

Public concerns have already been identified and described in several different places, from news stories to public hearing transcripts. The purpose of this study was to summarize in one document the major issues being raised by concerned citizens regarding both ocean and land-based incineration. The focus of this task was to answer the question: What are citizens' attitudes and concerns that affect the siting and permitting of incinerator facilities?

This report identifies and compares public concerns and objections to land-based and ocean incineration. It also identifies the public's proposed solutions, examines the perspectives of government agencies and companies about public concerns, and identifies potential barriers to implementing regulatory programs for incineration.

It should be emphasized that this study is not an exhaustive survey of public opinion on incineration, but rather a study which discusses the concerns reported by a sample of those who have already expressed interest, concern or opposition. The issues described here were documented in the summer of 1984, and primarily reflect opponents' concerns from a period between 1980 and 1983.

Since that time, EPA has taken a number of actions to address many of the concerns about ocean incineration. We have issued proposed regulationss, developed a comprehensive research strategy, and gathered more information, particularly on comparative risk, through the Agency-wide study of which this report is a part. Regardless of actions already taken, the value of this report is in the documentation of concerns and opinions of interested and affected members of the public, for future reference and continuing discussion.

The approach used in this study was to identify only those incinerator siting and permitting activities where there has been opposition, and to gather as much information as possible from the parties involved.

Screening calls were made to EPA Regional offices to identify the land-based hazardous waste incinerators that have received public opposition. Baseline data on the specific incinerators were gathered from these calls. In addition, we analyzed public hearing transcripts, where available, for both ocean and land-based incinerators to which there has been public opposition. From the analysis, we developed an initial list of major public concerns. Public hearing transcripts and screening calls were used to generate an interview list of knowledgeable and interested individuals and representatives of public groups, companies, and state agencies. We conducted eighty telephone and in-person interviews for 12 case studies in which there has been public opposition: two ocean cases and ten land-based cases.

II. PUBLIC CONCERNS AND SOLUTIONS

This section describes in considerable detail the incineration cases studied, the specific concerns of citizens, and the solutions they offered, first for ocean incineration and then for land-based incineration. Finally, there is a brief discussion comparing ocean and land-based incineration in terms of specific concerns, parties involved, and impacts of opposition.

A. Ocean Incineration

1. Background Information on Ocean Cases Studied

Incineration Facilities Studied: For ocean incineration, there are only two case histories to examine. All of EPA's permitting experience is with one company, Chemical Waste Management, Inc. A second company, At-Sea Incineration, Inc., has progressed to the stage of applying for a research burn permit and searching for a port site. Both companies have experienced public opposition to their activities.

Chemical Waste Management (formerly Ocean Combustion Services) owns two incinerator ships, Vulcanus I and II, which are currently in operation off the coast of Europe. Starting in 1974, Vulcanus I has been used to conduct four series of burns: three in the Gulf of Mexico and one in the Pacific Ocean. Chemical Waste Management has now applied for a permit for another burn at the Gulf site. The company's port facility is located in Mobile, Alabama. (The port site is physically located in neighboring Chickasaw, but is owned and operated by the City of Mobile). There has been intense public opposition to the burn permits and to the use of the port facility in Mobile.

At-Sea Incineration launched the Apollo I incinerator ship in February 1984 and is currently constructing a second incinerator ship, Apollo II. Both vessels must undergo a battery of sea-trials prior to certification by the Coast Guard. The company has applied to EPA for a research burn permit, and has been searching for several port sites, including sites in Newark, Philadelphia, and Lake Charles, Louisiana. There has already been public opposition to the use of a port facility in Newark.

This study examined public opposition to the proposed permit for Chemical Waste Management to burn in the Gulf of Mexico, and the proposed siting of a port facility by At-Sea Incineration in the Newark area.

Parties Involved in the Debate: A wide range of groups and individuals have been involved in the debate over the ocean incineration program, and over specific permits and sites. In the case of Chemical Waste Management's proposed burn permits, there has been increasing opposition from broad-based local citizen and business groups, and state and local government officials. There has also been active participation in the debate by a few national environmental groups, and by some land-based incineration companies.

Most opposition to land-based incineration comes from the local population living or working near the incineration site, and therefore directly affected. But because the "site" of Chemical Waste Management's permit is perceived by the participants as the entire Gulf plus the port facility at Mobile, the "local" area affected is synonymous with the entire Gulf region.

The parties who have been most actively involved in the debate over Chemical Waste Management's permits include five local or state environmental groups, five local or state civic associations, two regional or state business groups, four broad-based regional or state coalitions, government officials from three local communities and three states, and three national environmental groups. (See Appendix for complete list.) Not all of these groups and individuals are opposed to ocean incineration or to specific proposed permits. (For example, of the three national environmental groups, the National Wildlife Federation supports ocean incineration, while Greenpeace and The Cousteau Society oppose it.) But all of these parties have been interested and involved in discussions of permits or regulations for ocean incineration.

Local citizens and state officials assert that opposition has been a grass-roots phenomenon that became increasingly organized and sophisticated, with national environmental groups in a support role and land-based companies providing technical information. Concern about ocean incineration began with local populations in Alabama next to the port site and in Texas along the southern coast.

The two national environmental groups that oppose ocean incineration became involved after opposition had built locally, because they saw it as a national program that also includes Atlantic and Pacific sites and because of the universality of the ocean: "It's everybody's backyard."

Some land-based incinerator companies, as well as national environmental groups, testified at public hearings and aided local groups with technical comments. But according to state officials, the land companies did not create public opposition, they simply got free publicity out of it. There was tremendous public concern regardless of the role of land companies.

There was also substantial opposition to the proposed siting by At-Sea Incineration of a port storage and transfer facility in the Port Newark area. Opposition was raised initially by citizen groups in the residential Ironbound section of Newark. Public concern about hazardous waste storage and transfer then spread to other local communities (Elizabeth and Bayonne), making the issue more prominent at the state level, and finally gained some interest at the national level with the involvement of Greenpeace.

Some of the local groups in New Jersey who were most actively involved are: Ironbound Committee Against Toxic Wastes, Coalition for a United Elizabeth, Greater Newark Bay Coalition, Bayonne Organization Against Toxic Sites, and Hudson Regional Health Council. (It should be noted that some individual spokespersons seem to represent more than one of these groups, whose membership may overlap somewhat.)

Results of Opposition: Public opposition to ocean incineration permits from about 1980 to 1983 resulted initially in EPA's commitment to develop a "worse case scenario" and to develop more specific regulations to govern the program. Continuing opposition to EPA's tentative decision to issue a permit to Chemical Waste Management also strongly influenced EPA's decision to defer issuance of any more ocean permits until a research plan was developed, and until specific regulations applicable only to ocean incineration, and thus replacing the current requirements under the ocean dumping regulations, are developed and issued.

Public reaction was also a factor in EPA's decision to conduct an in-depth study comparing different aspects of ocean and land-based incineration, of which this study is a part.

EPA has sought early public input into the development of ocean incineration regulations by holding public meetings on issues and options. However, many public representatives who attended these meetings said they did not believe that EPA was really committed to incorporating their specific concerns, especially since the proposed regulations would be issued for public comment prior to the completion of the current study on incineration.

In the case of At-Sea Incineration's proposed port facility in Newark, the company was still planning as of January 1984 to locate its New Jersey facility in Port Newark.

2. Specific Public Concerns Regarding Ocean Incineration

This section describes the specific concerns raised by a sample of opponents and interested citizens regarding ocean incineration, beginning with a brief overview.

The two areas of concern cited most often are: (1) the risk and potential environmental impacts of spills on land and water from routine activities and catastrophic incidents; and (2) perceived poor management of the ocean incineration program by EPA in the past. Many of these people are not completely against an ocean incineration program, but they do want significant safeguards and guarantees. As one Alabama resident summed up the situation: "In general, the concerns are not about the technology but about the management aspects. It's a people issue. It's a question of who's running the program and who's running the ships."

People living near proposed or approved port sites in Alabama and New Jersey are especially concerned about the health and safety risk of spills on land or in the port due to transportation, storage and handling activities. Texas residents are especially concerned with the environmental and economic impacts of spills in estuaries and open water. And national environmental groups are worried about the environmental impacts of spills on the open ocean. Almost everyone complained about various aspects of EPA's management of the program in the last few years. As one Texas resident commented, "If EPA had handled the ocean incineration program differently, there might not have been all these concerns about it."

The following discussion of specific concerns is organized according to the frequency with which they were raised, discussing first those concerns mentioned most often. The concerns are taken from interviews with citizens who have been most actively involved in the debate and who each represent a state or local citizens' group (including ten from Texas, eight from Alabama, two from Louisiana, and three from New Jersey), plus one each from the three national environmental groups. In the following discussion, many related concerns are grouped together in order to highlight major issues.

Risk of Spills on Land and Water from Routine Transport, Storage and Handling: The public is primarily concerned about the potential for spills from transportation accidents, which could occur on the way to the port, in the port, or on the open water of the Gulf. In addition, there are concerns about leaks from storage containers and spills from mishandling.

In Chickasaw, Alabama, residents contend that access to the port facility is on narrow residential streets that are not built for truck traffic, and that pass two schools on the way to the port. A city official in Mobile contends that a proposed storage facility at the port would be susceptible to damage from frequent hurricanes, and that there is a high probability of accidents in the "very narrow, tortuous and dangerous" ship channel connecting the Chickasaw port with the Mobile River. New Jersey residents have similar concerns, believing that the proposed port facility would significantly increase the volume of tanker trucks in a populated area,

that statistics on truck accidents show a poor record, and that the Newark shipping channel is narrow and has about fifty accidents a year.

Several Alabama residents feel that storage of hazardous waste would be as much of a problem as the actual burn at sea, especially storage of hazardous waste within the coastal flood plain. They contend that RCRA prohibits storage of PCBs in a flood plain, and that both FEMA and EPA Regional officials have advised local officials in Mobile to prohibit the storage of hazardous waste in that flood plain.

Risk of Catastrophic Spills in Ports and on Open Water: Residents along the Gulf Coast worry about the potential for unusually large spills or releases in port or at sea that would cause major damage to the marine environment. Most discussion focuses on major spills due to catastrophic events, including ship collision or grounding, fire, flood in the port area, or intentional dumping in life-threatening conditions such as bad weather at sea. Bad weather at sea and flooding in port areas are of particular concern because the Gulf is a hurricane-prone area. Many people feel that the probability of a catastrophic release is very high, based on their knowledge of ships and sailors and the characteristic water and weather conditions in the Gulf. Others feel that the probability of a catastrophic release might be low, but that the resulting environmental damage is potentially very high, and therefore even a low probability is unacceptable.

Alabama residents feel there is a very high probability of catastrophies due to hurricane damage to storage facilities or to accidents in a highly congested harbor. Texas fishermen, Greenpeace and The Cousteau Society believe the potential for accidents at sea is high. Some people insisted that there is a high rate of oil tanker accidents on the Gulf, with ships running into other ships and into oil rigs. The Cousteau Society comments that "From our extensive experience on ships and at sea, we can assure you that docks, harbors and the open ocean are not places which minimize chances of accidental release of wastes, or where spill cleanup would be possible, or effective environmental monitoring could be implemented. We can think of no worse place than the ocean to transport and destroy hazardous wastes."

Potential Health and Environmental Impacts from Spills: The general concern expressed is that the potential effects are unknown, and that there are too many unanswered questions. The major fear is about pollution of the marine ecosystem from spills in the port or in the Gulf, which could immediately impact nearby estuaries, wetlands, and fishing grounds, with the additional potential for long-term effects of bioaccumulation and magnification of persistent toxic pollutants in the food chain. The estuary and wetlands of Mobile Bay provide a breeding

ground for the fishing industry, and citizens believe that a spill there could directly affect the food supply. People worry that pollution in the ocean could damage fisheries, beaches, and endangered aquatic species such as turtles and whales. Fears were also expressed about surface and ground water pollution resulting from leaks or spills in a flood plain, as well as the direct health and safety aspects of transportation-related spills on land.

Perceived Poor Management of EPA's Regulatory Program for Ocean Incineration: Almost everyone interviewed complained about the way EPA has handled the ocean incineration program in the past, and for some it was their primary concern. Many people believe EPA has made a decision that this is a preferred technology before the data are in to back it up; and that the Agency is embarking on a major program without answers to some very basic scientific questions. They feel that there is simply not enough information about risks and impacts in order to make informed decisions on how to regulate ocean incineration. Since the public feels that there could be significant negative impacts, they question whether it is reasonable to go ahead with the program without having evaluated the need for ocean incineration, the associated risks, and the alternative technologies available.

Public concern also focused on other aspects of program management, especially EPA's actions to issue permits without regulations in place, and then to develop regulations before in-progress background studies are completed. Citizens interpreted these actions as evidence of an ad hoc, poorly planned program that is not in the best interest of the public or the environment. Concerns about some specific aspects of program management include the following perceptions:

- Lack of biological information, such as biological baseline data on the burn site to determine carrying capacity and allow later evaluation of impacts, and data on Gulf habitats of endangered species.

- Improper process for developing regulations, such as developing proposed regulations before in-progress background studies are completed, and developing research protocols simultaneously with regulations instead of prior to regulations. These activities have created the perception that the Agency has been unnecessarily "in a rush" to propose and finalize regulations.

- Inadequate biological testing and methodology in the past, including incomplete monitoring results from past test burns, lack of standard (and practical) procedures and protocols for environmental monitoring, and lack of a rational research plan.

- Lack of plans for ongoing biological monitoring at the burn site in order to evaluate subtle or long-term biological effects.

- Inadequate public participation, due to inadequate public notification of affected local residents regarding proposed permits and port sites, and difficulty in getting requested information from EPA.

- Inadequate participation by state and local government agencies in decisions on permitting and siting.

- Lack of openness, integrity, and sensitivity of EPA, based on news stories suggesting collusion between company and EPA officials in the early years of the program, and the feeling that EPA did not answer questions or willingly provide information, causing the perception of a "cloak of secrecy". There were also complaints of poorly managed public meetings on regulatory options: rude and disdainful treatment of citizens, limited invitations, materials received too late for adequate review, contradictory statements by EPA officials, and lack of official transcripts of meetings.

Inadequate Regulatory Controls: Public concerns about inadequate restrictions on ocean incineration are a logical extension of many of the other concerns, such as the potential risk and impacts of spills and the need to protect ocean resources. Some people felt there should be more stringent standards at sea than on land, because they believe that things go wrong at sea more often than on land and that the ocean is more environmentally sensitive than land. Others feel that the requirements for monitoring emissions and for destruction efficiency achieved by the incinerator should be the same for incineration at sea and on land. Many people feel that ocean incineration regulations should be more comprehensive in order to cover cradle-to-grave transportation, storage, and handling of hazardous wastes to be incinerated.

Many people believe that the requirements in proposed permits have been inadequate, such as the lack of stack scrubbers and insufficient requirements for liability insurance and contingency plans. One person asserted that the POHC monitoring system was inadequate, and that the company should test for byproducts of combustion for all wastes that are fed into the incinerator. There was a suggestion that waste mixing should be limited because mixing of incompatible wastes might cause explosions, and on the ocean containment of the resulting spill would not be possible. A few people worried that incineration would eventually be allowed for inappropriate wastes such as heavy metals, low level radioactive wastes, and wastes that bioaccumulate or biomagnify in a marine environment.

A major concern for many people is the issue of liability. Who is legally liable for accidents at sea: the generator, the incinerator company, or nobody? How can anyone prove damage, or recover damages? Since cumulative damage may not show up for ten years or longer, who will be responsible at that time? "Besides," said one person, "it's too late by then, since no one can compensate for the loss of sea turtles, bottom fishing, or a major coral reef." Someone else noted that it's extremely difficult to calculate the loss of expected revenue for the seafood and resort industries and sport fisherman. It was suggested by some people that the company should be required to cover damage from the worst case. "If liability is too great, and insurance too expensive, then maybe ocean incineration should be re-evaluated."

Difficulty of Implementing Ocean Incineration Program: Many people worry about the difficulties of implementing an adequate regulatory program, even if we have the best regulations. The two major concerns are that enforcement and compliance monitoring will be difficult on the ocean, and that environmental monitoring of long-term impacts on the ocean's ecology will be almost impossible. Finally, there is some concern that no one will really be regulating cradleto-grave transportation, including transport from the Emelle landfill to the port, and from the port to the burn site.

The public believes that enforcement and compliance monitoring are much more difficult on the ocean than on land. They believe that it is difficult to adequately monitor a mobile facility, since regulatory agencies can't do unannounced spot checks. They worry that when the incinerator burns at night, at 200 miles off the coast, it is "out of sight, out of mind." A shiprider might be feasible, but they question how he would keep his objectivity. A black box records, but it is not preventive. One Texas fisherman commented that, based on his long experience with ships and sailors, he is convinced that there is simply a lack of any practical way to regulate ocean incinerator ships.

Unsuitable Burn Site in Gulf: Many Gulf coast residents feel that the unique ecological characteristics of the Gulf of Mexico and of the specific burn site in the Gulf make the designated site unsuitable. They contend that because the Gulf is a semi-enclosed inland sea, the water circulation pattern would send any toxic spills toward the Texas shoreline rather than out to the Atlantic Ocean. They believe that since only a little water escapes, the Gulf will retain most of what is placed in it. In addition, it was alleged that the designated burn site is located 20 miles from the "Flower Gardens," which is said to be the only living coral reef in this part of the hemisphere, and a site that has been repeatedly proposed for special protection. People worry about impacts

on endangered species in the Gulf, such as the brown pelican, sea turtles and whales, and that incineration will interfere with the bird flyway over the Gulf, since the Gulf is part of a major bird migration route.

In addition to being concerned about protecting the Gulf's ecology, coastal residents believe that the Gulf's large amount of daily ship traffic creates a high probability of ship collisions. Finally, international relations was mentioned as a constraint on use of the Gulf site, with specific reference to an existing treaty with Mexico to prevent pollution in that body of water.

Several people said they were not opposed to ocean incineration, but were opposed to the Gulf site because EPA hasn't determined the Gulf's biological carrying capacity for incineration, or developed regulatory controls that would reduce the opportunities for accidents. One Texas resident said he believes that the opposition to the Gulf site is partly the syndrome of "not in my backyard," because the local population feels it may be hurt in terms of local food supply and local industries such as fishing and tourism.

Company Credibility: Many reported concerns relate to the lack of credibility of the two ocean incinerator companies. One of the companies was perceived as having a questionable past record of hazardous waste management practices elsewhere. Both companies have also been accused of not dealing openly with the public, and of failing to provide adequate information on the technology and health and environmental effects of ocean incineration. Accusations in news stories of past collusion between Chemical Waste Management and EPA have increased the public's feeling that the company is trying to get away with something, and that their activities are not being carried out in good faith.

In addition to their concerns about the two specific companies involved in ocean incineration, a number of citizens reported a "serious concern" about the past and present involvement of organized crime in the hazardous waste industry, and about the "extremely high opportunity for corruption" that is presented by highly profitable ocean incineration activities.

Inadequate Incineration Technology: There were a few concerns about the technical aspects of incineration at sea. There was concern that the destruction efficiency is not sufficient to protect the marine ecology at the burn site, and that it will be difficult to maintain optimal operating conditions at sea because of the effect of salt water and motion on the equipment. There was also concern that use of outdated technology would be allowed even though better technology is available, and that there would be less stringent technical requirements for ocean incineration than for landbased (e.g., lack of scrubbers and secondary burn chambers). A final technical disadvantage

noted by some was that conservation of heat energy is not possible at sea, as it is on land.

Adverse Economic Impacts: Many people are concerned that pollution from incineration activities in the Gulf will harm existing commercial and non-commercial activities that are dependent on a healthy marine ecology and coastal environment. Especially strong concerns were voiced regarding likely harm to the fishing and tourist industries, which are major elements of the economies of many coastal states. There is also some concern about adverse impacts of water pollution on general lifestyles in the Gulf region, involving fish as a major food source and water-based recreation, which would affect both local residents and the tourist industry.

Residents assert that there would be substantial economic ramifications from damage to the marine fisheries. One Texas resident quoted an estimate that the fish and shrimp industry in the Gulf is worth about $500 million a year, and accounts for 70% of the U.S. fish production. A Louisiana resident noted that Louisiana's economic health depends more on fisheries than on the petrochemical industry. An additional problem for fishermen is that even if there is no real biological damage from spills, rumors of spills can kill the shrimp market for several weeks. A Texas fisherman said that their past experience with oil spills is that public perception of damage from spills in the Gulf results in enormous loss of marketability of shrimp and other seafood.

Residents are also very worried about economic impacts on the tourist industry on the Gulf coast, although no dollar estimates were quoted. For example, an elected town official of South Padre Island, located near the southern tip of Texas, is concerned about protecting the environment, and thus the economy, of that totally tourist community. Not only would residents be affected, said the town official, but also the tremendous number of people who have investment property there, many of whom live in the Houston area.

Inadequate Emergency Response Capability: There are concerns among citizens in Alabama and New Jersey that local fire departments might not have adequate training or resources to respond to emergencies involving toxic waste spills on land or in port. Of even more concern to some people is the lack of adequate technology available for containing or cleaning up major toxic waste spills on the open ocean. There were also several complaints about the lack of reality of Chemical Waste Management's contingency plan. The company's plan apparently did not reflect local conditions, such as the fact that Chickasaw has only two firemen, and has no hotel for the company to use as a base for emergency operations.

Potential Environmental Effects of Air Emissions: Some citizens are concerned about the potential long-term effects of air emissions on the marine environment. Specific concerns include the hazards of unburned organic residues and byproducts, and of acid air or acid rain. There is concern that particulates could fall and be trapped in the ocean's microlayer and have long-term impacts on the larva of seafood, which is the first part of the food chain.

Unsuitable Port Sites (Mobile, Newark): Many residents near the port sites in Mobile and Newark feel that the storage and tranfer of toxic wastes should not be located near such high density populations. It was also asserted that both ports involve a dangerously narrow and winding navigation route from the dock facility to open water, and both ports are heavily used, with a high likelihood of accidents. In Mobile, there were complaints of poor land access to the company's dock facility, requiring trucks to travel on narrow streets through residential neighborhoods. Mobile also involves a wetlands area, and is located in a flood plain and hurricane-prone area. Newark residents complained that their port is located in an area that already faces a large safety threat from existing industry and hazardous waste disposal sites.

Lack of National Strategy for Managing Hazardous Waste: A number of people said they are concerned by the perceived lack of a national strategy for managing hazardous wastes, which could provide the framework needed for a decision to either promote or abandon ocean incineration. Many feel that environmental risks at sea are significantly greater than on land, and that ocean incineration is therefore neither a quick fix nor the ultimate answer. They suggested the need for more research on alternative technologies, and that EPA should have a long-term strategy that promotes the reduction of wastes produced and energy recovery.

Need to Protect Oceans as a Public Resource: In general, people interviewed see the ocean as a public resource worthy of special protection, especially as a primary food source. Several people pointed out that this presumption in favor of special treatment underlies the requirement of the London Dumping Convention that a need for ocean incineration must be demonstrated before issuing permits to burn. They also complained about the lack of a required needs assessment, and insisted that in fact there is a currently unused capacity for land incineration, and therefore no need for ocean incineration.

Negative Impact on Better Methods of Hazardous Waste Management: Some citizens are concerned that promoting ocean incineration would have the effect of discouraging industry from moving toward better methods, such as waste reduction and recycling.

Importation of Outside Wastes: Citizens in Alabama, Louisiana and New Jersey complained that wastes generated elsewhere were being transported into their local areas. They assert that their states are already dumping grounds with major environmental problems, and that it is unfair to use them as a dumping ground for the rest of the country.

3. Solutions Offered by Citizens Regarding Ocean Incineration

As part of this study, we asked the participants to list specific solutions to their concerns about ocean incineration. The following list summarizes the solutions offered to specific areas of concern.

Risks from Transport and Handling:

- Strengthen the controls on transportation of hazardous wastes, or better enforce existing regulations.
- Reduce transportation of hazardous waste by managing it on land, and especially on-site (i.e., where generated).
- Choose a different port site which can provide a safe transport route.

Poor Site Suitability:

- Have EPA set national siting criteria for both the burn site and the port facility.
- Site the port in an area of low density population.
- Site the port in a more accessible area.
- Require sufficient buffer zones for all burn sites in order to minimize environmental impacts.
- Don't burn in the Gulf.

Inadequate Regulatory Controls:

- EPA should provide a practical process for effective monitoring of ocean incineration (both ambient and compliance).
- A 24-hour shiprider should be required to accompany all ocean incineration vessels.
- EPA should require scrubbers for ocean incineration.
- Better liability and contingency plans should be developed.

Unsatisfactory Process for Developing Ocean Incineration Program:

- Prepare a risk assessment for different port and burn sites within the Gulf area.
- Prepare a needs assessment to determine if the need for ocean incineration exists.
- Provide complete baseline data on the proposed burn sites.
- Prepare an Environmental Impact Statement for the port site.
- Keep the public informed, and include the public in the regulation development process.
- Don't draft the ocean incineration regulations until the studies are completed and all alternatives are considered.

EPA Credibility:

- EPA should seek scientific sources outside the agency to do studies. Also, a system of peer review should be set up to evaluate the studies.
- EPA should remain a neutral party - don't promote ocean incineration or specific companies.
- EPA should improve enforcement of existing regulations.

Company Credibility:

- EPA should include a moral integrity clause in the ocean incineration regulations to assure that the incineration company is reputable.
- Incineration companies should be more open with the public and attempt to provide complete information to all concerned groups.
- The companies should make an effort to familiarize themselves with the local areas, and to work within the communities to address both the technical and non-technical concerns.

Alternatives to Ocean Incineration:

- Incineration on land, and especially use of mobile land incinerators.
- Store the waste until newer, more effective disposal technologies are developed.

- EPA should provide economic incentives to encourage waste reduction at the source.

- EPA should promote more permanent and acceptable alternatives such as waste reduction, recycling, neutralization and detoxification.

B. Land-Based Incineration

1. Background Information on Cases Studied

Incineration Facilities Studied: When regulations governing land-based hazardous waste incinerator facilities were issued in 1981, there were about 350 existing incinerator facilities that continued to operate under "interim status" while waiting for permit applications to be requested by EPA. As of the summer of 1984, EPA had received about 200 permit applications from companies interested in continuing to operate their facilities. Public hearings on proposed permits had been held for about two dozen existing facilities, and the Agency has now issued 23 final permits. For proposed new facilities, only four permits have been issued.

From the screening calls made to EPA Regional offices, we identified fourteen cases where there has been some degree of public opposition. We found that public opposition is likely to occur when facilities go through the RCRA permitting process or TSCA approval process, because the public can then voice concerns through public hearings and meetings. Twelve of the cases were either in the RCRA permitting or TSCA approval process, while two cases were still undergoing State-level review prior to public hearings.

We also found that most opposition was to off-site commercial facilities rather than on-site facilities: eleven cases were off-site, while only three were on-site. Moreover, all new off-site facilities have been the target of some opposition. The prospect of public opposition is one incentive for commercial companies to purchase existing facilities with interim status rather than construct new ones.

We examined a sample of ten out of the 14 cases in more depth.* These ten included the three on-site facilities, of which two were new and one was existing, plus seven off-site facilities, of which three were new and four were existing.

Table 1 (next page) provides background information about each of the ten cases examined. At the time of our survey in July 1984, four of the five existing facilities were currently operational. All five have interim status and have yet to go

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* Three cases not examined due to lack of easily accessible citizen contacts for interviews at the time of our survey were IT, Massachusetts; Rollins, Louisiana; and Rollins, Texas. A case study of ENSCO, Arkansas, appears in "The Siting of Hazardous Waste Management Facilities and Public Opposition" (U.S. EPA, SW809, Nov. 1979), and was reviewed as part of this study.

TABLE 1

STATE	COMPANY NAME	TYPE OF FACILITY*	PERMIT STATUS	CURRENT OPERATIONAL STATUS (as of January 1985)
New York	GE	On-site	- Has RCRA interim status, Part B submitted, and TSCA approval pending.	- Operational. PCB trial burn conducted.
New Jersey	Rollins	Off-site	- Has RCRA interim status, Part B submitted, and TSCA approval pending.	- Operational since 1968. Will conduct PCB trial burn.
North Carolina	Mitchell Systems	Off-site	- Has RCRA interim status and Part B called in.	- Operational since 1981.
Kentucky	Pyrochem	Off-site	- New facility with RCRA Part B submitted.	- Permit application technical review at state level. Construction not started.
Illinois	SCA	Off-site	- Has RCRA interim status, Part B submitted, and TSCA approval.	- Operational since 1981.
Ohio	PPG	On-site (would receive some off-site waste	- New facility with RCRA Part B permit issued.	- Construction expected to begin in 1985.
Michigan	BFC	On-site	- New facility with RCRA Part B permit issued.	- Construction started.
Ohio	WTI	Off-site	- New facility with RCRA Part B permit issued.	- Construction started.
Ohio	Cincinnati Waste Disposal (Municipal)	Off-site	- Has RCRA interim status.	- Operational.
Louisiana	IT	Off-site	- New facility with RCRA Part B permit issued.	- State permit being appealed. Construction not started.

* For purposes of this report, an off-site incinerator is defined as a commercial operation which accepts hazardous waste that is generated at outside sites. An on-site incinerator is one which accepts hazardous waste generated on the same site.

through a public comment period for their RCRA permits. The existing facility not operational was the municipal incinerator in Cincinnati, which had been closed by the state for air emissions violations. As of January 1985, this facility had resolved its problems and become operational again.

The remaining five facilities were proposed new facilities which must obtain RCRA permits before starting construction of the facility. Four of the five new facilities had been issued RCRA permits, but one of those was delaying construction because its state permit was being appealed.

Parties Involved in Opposition: A range of public groups has been involved in opposing both new and existing land-based incinerators. The opposition has been primarily local rather than regional or national. The types of groups involved in opposition are categorized below:

- Local groups (e.g., below state level) organized for the specific purpose of opposing the siting or permitting of a hazardous waste incinerator (e.g., Those Opposed to the Experimental Incineration of Chemicals (BFC); Save Our County (WTI); and Save Ourselves (IT).

- Previously existing coalitions and civic groups working at the local level (e.g., Avalon Trails Home Improvement Association (SCA); and East Ascension Sportsmen's League (IT)).

- Previously existing local groups with an environmental focus (e.g., People for Environmental Protection, and Americans for Environmental Action (Rollins); Citizens for a Better Environment, and Lake Calumet Study Commission (SCA); and Citizens for Clean Water (GE)).

- Local elected officials or appointed public boards that either have an official role in siting or permitting or who play an advisory or advocacy role (e.g., Township Environmental Commission (Rollins); and Environmental Advisory Council (Cincinnati Waste Disposal).

- State environmental organizations that have become involved at the local level (e.g., Ecology Center of Louisiana and Louisiana Chapter of Sierra Club (IT); and Scenic Hudson (GE)).

- Individual local residents unaffiliated with any formal group.

It is difficult for us to judge the extent of local opposition. Companies and state officials indicated that in some cases a majority of local residents were opposed, while in others the opposition stemmed from a small but highly vocal segment of the local population.

Results of Opposition: Public opposition has produced several impacts that can be readily measured. A specific impact has been to delay the siting and permitting process. In several cases, permits were issued by state or federal agencies but subsequently appealed by local opposing parties (WTI, IT, BFC and PPG). In one case, public opposition caused the company to announce that an alternative site for its proposed facility would be selected (Pyrochem). Public involvement has also caused regulatory agencies to make permit changes which incorporate specific public criticisms and suggestions (Rollins, WTI, and SCA). Finally, public involvement has in some cases resulted in the creation of citizen advisory committees to deal with issues relating specifically to the facility (PPG and Rollins).

Public opposition is also responsible for several impacts that are not directly measurable. For example, opposition has caused companies and government agencies to provide more information to the public. It has also contributed to raising local awareness of the issues and has encouraged other local groups, the media, and politicians to become involved.

Public Support for Incineration Facilities: In some cases initial public opposition has eventually been replaced or overridden by public support. In the case of the new off-site incinerator facility now being built by Waste Technologies Industries (WTI) in East Liverpool, Ohio, the East Liverpool City Planning Commission asserts that public opposition was from a few vocal individuals "whose only concerns were their own self-interest." The Planning Commission, after careful study of the proposal by a special task force, unanimously gave its "enthusiastic approval" for the proposed facility. An East Liverpool citizen who supports the WTI facility recommends that specific concerns raised by citizens regarding other facilities should be made a part of the permit, as was done for the WTI permit in East Liverpool.

A similar case is the proposal by PPG Industries for a new on-site incineration facility in Circleville, Ohio. Although the permit approval was appealed by a local citizens' group, the Pickaway County Commissioners did not object to the permit issuance and the opposing citizens' group eventually withdrew all appeals. This dissipation of opposition was because of an earlier, separate agreement between PPG and the Pickaway County Commissioners providing for environmental protection measures extending beyond the requirements of the law in order to respond to citizen concerns.

2. Specific Public Concerns Regarding Land-Based Incineration

The following concerns were reported by citizens opposed to land-based hazardous waste incinerators. The first five concerns listed below were raised most frequently.

Health Risks from Air Emissions: Under the major heading of health risks due to air emissions, a variety of concerns were voiced. The health risks associated with fugitive air emissions are of concern to many people. Localities with existing air quality problems, for example areas subject to air inversions and areas with a non-attainment status for a National Ambient Air Quality Standard (NAAQS), are greatly concerned about any additional air emissions. Areas with a high incidence of birth defects or respiratory ailments are also concerned about additional air emissions. Other concerns included the lack of knowledge of the chemical synergisms between air pollutants, the effects of toxic air pollutants on the chronically ill, and the lack of emission standards for products of incomplete combustion (PIC's).

Risk of Spills from Transport and Handling: The risk of spills from transport and handling of hazardous wastes is a major concern. While transportation accidents are of primary concern, citizens are also concerned about container leaks and spills from mishandling or vandalism. Fears were raised about surface and groundwater pollution resulting from leaks or spills, and the potential impacts on health and the environment.

Company Credibility: The credibility of the company managing the incinerator facility is of great concern to citizens. There are two main areas that have an effect on how the company is perceived by the public. The first is directly tied to the company's public relations effort. The public is very sensitive when it feels that information is being distorted or withheld. Two case studies in Ohio (PPG-Circleville, WTI-East Liverpool) are representative of this situation. According to opponents, the PPG facility was initially presented to the public as an "energy recovery unit," and the WTI facility as a "waste to energy" unit. In both cases no mention was initially made of hazardous waste. Public distrust of the companies was heightened when it became known that the facilities would be burning hazardous waste.

The second factor influencing credibility is the company's past record. The company's environmental, financial, and management records often are subjected to close scrutiny by the general public. Local investigations of different companies have uncovered information considered by citizens to be damaging. Some examples are:

- One company had three ownership changes in three years. It reportedly followed a pattern of pollute, file for bankruptcy, and reorganize;
- For one company, a landfill at the same site had already contaminated the groundwater;

- In one case a company facility had 164 previous violations of its NPDES permit;

- One facility's management was found to have been indicted on charges of not reporting toxic releases at other sites.

Insufficient Resources for Effective Monitoring and Enforcement: A major public concern is that the regulatory agencies do not have sufficient resources to adequately monitor land-based hazardous waste incinerators and to enforce enforce regulations. One commentor highlighted this by stating that incinerators operate 24 hours a day, while regulatory agencies do not.

Poor Site Suitability: Many people are concerned about how well suited some of the locations are for siting hazardous waste incinerators. Of major concern is the incinerator's proximity to populated areas, allowing for a larger potential impact should an accident occur. Other aspects of site suitability which concern citizens are the location of a plant in a valley flood plain, over an aquifer, near a river, on fertile soil, or in areas where heavy industry has already contributed to high levels of pollution.

Inadequate Emergency Response Capability: Another concern raised in several cases is that no contingency plan had been prepared by local government authorities. In smaller towns, concern was expressed that even with a contingency plan, the available emergency facilities were inadequate to handle a major accident.

Uncertainties about Incineration Technology: The public had questions about the efficacy of the present technology and how well it has been tested. The validity of trial burn data, the availability of toxicity data, the level of environmental protection that a 99.99% destruction efficiency offers, the long-term viability of incinerators, and the unknown long-term effects of incineration on the environment are all of concern to the public.

Unsatisfactory Siting and Permitting Process: A major concern is the lack of public input into the siting and permitting process. The lack of public access to information and the lack of siting criteria are other related concerns that were raised.

Importation of Outside Wastes: Another concern is that the wastes incinerated in one locale were generated outside of the immediate area (often out of state). Citizens in many communities feel that they are being used as a "scapegoat", becoming a dumping ground for the country's hazardous waste. While some individuals feel that the incineration of hazardous waste is needed, they do not feel that they should be expected

to handle outside wastes and the accompanying risks. This concern is intensified when the waste includes PCB's, dioxins, and other highly publicized wastes.

Adverse Economic Impacts: Also of concern to the public is that off-site incinerators do not provide sufficient economic benefits to the local community to offset the risks imposed on them. People feel that few if any jobs are provided by commercial hazardous waste incinerators, although minor benefits sometimes result from increases in the local tax base. Potential economic costs of all incinerators are often cited, including declines in property value, property damages from corrosion, general community deterioration, and possible damage to agricultural crops.

Nuisance: In the case of a facility that is already operating, a few local residents are concerned about noises, odors, and gases that they claim irritated their eyes and noses. There is some concern that continued incineration of hazardous wastes will only make the situation worse.

3. Solutions Offered by Public Regarding Land-Based Incineration

As part of our survey, public groups were asked to offer solutions to the problems and concerns they identified. The following list indicates specific areas of public concern and summarizes the solutions offered.

Unsatisfactory Siting Process and Poor Site Suitability:

- Develop explicit site selection criteria, such as not siting near residential areas and siting where waste is generated.
- Decentralize hazardous waste disposal and treatment sites, rather than put the burden on one community.
- Public should have a more active role in decision-making prior to siting a facility.
- Companies and government agencies should provide more and better information to the public from the outset, before any siting decisions are made.

Unsatisfactory Permitting Process:

- Create an independent agency to evaluate and arbitrate permit decisions and to assist citizen groups.
- Companies and government agencies should provide more and better information to the public from the outset, before any permitting decisions are made.

- Regulatory agencies should maintain more of a neutral position. Under current procedure, the permitting agency is perceived to be in the position of endorsing a specific facility when it issues notice of a draft permit to the public.

- The public should have a more active role in decision-making prior to issuing a draft permit.

Inadequate Regulatory Control:

- Strengthen monitoring and inspection program by requiring independent, periodic inspections financed by a tax on the company.

- Require ambient air and water monitoring.

- Require monitoring for products of incomplete combustion (PICs).

- Regulatory agencies should put more emphasis on protecting health and the environment by requiring risk assessments and environmental impact statements.

- Improve coordination between EPA and states in enforcement activities.

- Require incinerator companies to carry larger insurance or establish a public trust fund.

Uncertainties About Incineration Technology:

- Require that state-of-the-art technology be used.

- Conduct additional research to determine the validity and safety of incineration technology.

C. Comparison of Public Response to Ocean and Land-based Incineration

Parties Involved in Opposition: The core of opposition to both ocean and land-based incinerators has been from local citizens. For both types of facilities, local opposition has included not only environmental groups but also broader based civic associations and local government officials. In both situations, state-wide environmental organizations have eventually become involved, as well as some state politicians and congressmen.

Opposition to ocean incineration has been more regional in scope, since an incinerator ship is perceived by many citizens to potentially have multi-state impacts. Opposition to ocean incineration has also involved a wider range of people, including congressmen and governors, fishermen and farmworkers, scientists and local residents, and employees of land-based incinerator companies. While the priority concerns of each group may differ, they seem united by their opposition to facilities that they believe would significantly harm their communities, jobs and lifestyles. Only for ocean incineration has there been active opposition by a few national environmental groups and some competing (land-based) incinerator companies.

Impacts of Opposition: For both land-based and ocean incineration, the measurable impact of citizen opposition has been to delay the EPA permitting process, and to make it more difficult to obtain local or state government approvals for the siting of land-based incinerators and port transfer facilities for ocean incineration.

For ocean incineration, citizen opposition was a factor in EPA's decision to delay new permitting until the Agency has issued specific regulations applicable only to ocean incineration, and thus replacing current requirements under the ocean dumping regulations. Opposition was also a factor in the Agency's decision to conduct a study of incineration to see whether there was any new information that would indicate a need to change the Agency's basic approach toward regulating ocean or land-based incineration. (This study of public concerns is part of that larger effort.)

Specific Concerns Reported By Citizens: Many of the concerns reported by citizens are the same for land-based and ocean incineration, such as the issue of potential spills of hazardous waste during transport, storage and handling. There are also some differences, such as the concern for potential health impacts from emissions on land, and potential environmental impacts from emissions at sea. Table 1 provides a comparison of the major concerns about ocean and land-based incineration.

TABLE 1: COMPARISON OF CONCERNS REPORTED BY CITIZENS IN OPINION SURVEY

OCEAN INCINERATION	LAND-BASED INCINERATION
• Risk of spills on land and water from routine transport, storage and handling, and accompanying health and environmental impacts.	• Risk of spills on land from routine transport storage and handling, and accompanying health and environmental impacts.
• Inadequate public participation in the siting and permitting process.	• Same.
• Insufficient state and federal resources for effective monitoring and enforcement of regulations.	• Same.
• Unsuitability of Gulf burn site and of port sites in Mobile and Newark.	• Unsuitability of incinerator sites.
• Lack of credibility of incinerator operators.	• Same.
• Uncertainties about incineration technology, and concern about level of environmental protection afforded by a 99.99 percent destruction efficiency	• Same.
• Adverse economic impacts on local fishing, tourism and property values.	• Adverse economic impacts on local property values and lack of increase in local employment.
• Inadequate local emergency response capability for accidents on land, and inadequate technology for cleanup of spills in ports and on open water.	• Inadequate local emergency response capability in the event of accidents.
• Risk to the marine environment from air emissions.	• Risk to human health from air emissions.
• The importation of outside wastes into local areas is inequitable.	• Same.
• Difficulty of enforcement and compliance monitoring and of environmental monitoring of long-term impacts on the ocean.	(Not reported for land.)
• Risk of catastrophic spills in ports and on open water.	(Not reported for land.)
• EPA's poor management of the regulatory program for ocean incineration.	(Not reported for land.)
• Regulatory controls are not stringent enough on scrubber requirements and other technical issues.	(Not reported for land.)
• Lack of a national strategy for managing hazardous waste in order to provide the basis for a decision to either promote or abandon ocean incineration.	(Not reported for land.)
• The ocean is a public resource which should receive special protection.	(Not reported for land.)
• Ocean incineration would inhibit development of better methods for managing hazardous waste.	(Not reported for land.)
(Not reported for ocean.)	• Nuisances such as noises, odors and eye-irritating gases.

III. PERSPECTIVES OF COMPANIES AND REGULATORY AGENCIES

As part of the study, we interviewed individuals connected with each case who represented state and federal regulatory agencies, and companies. In this section, we discuss their perspectives with regard to public concerns on ocean and land-based incineration.

State and Federal Regulatory Agencies:

- Regulatory agencies felt that public concerns were genuine although not always well-founded from a technical standpoint. It was pointed out that some of the concerns of citizens being reported here are based on inaccurate or incomplete facts.

- Regulatory agencies generally felt that they, and the companies, are doing as much or more than is necessary to comply with what is required under law. They felt that through the public comment and hearing process, they have given the public a fair chance to voice concerns and be heard. They also commented, however, that they are not able to respond to concerns which aren't technical in nature, and that technical answers are not sufficient in dealing with public fears of the unknown.

- They recognized that they are in the position of defending a proposed permit if the applicant meets technical requirements and regulatory standards.

- In some land-based cases, regulatory agencies indicated that through their efforts, public opposition had lessened, but that some segments of the public will always be opposed, no matter what.

- The EPA raised the issue that it was being unfairly criticized by the public for selecting poor sites for land incinerators and port facilities. They viewed this as unfair because they do not have a decision-making role in siting these facilities.

- Some EPA laboratory staff also felt that the Agency was being unfairly criticized by the public for inadequate biological testing during trial burns in the Gulf. They pointed out that the testing standards have changed over time, but felt that each specific instance of testing was adequate to the needs of that time.

- Some commentors from regulatory agencies suggested that EPA's ocean incineration program is very new and, as with any new program, there are still areas where complete information is not available. They felt that the public was not taking this into account and was being overly critical in light of the circumstances.

- Finally, there were several comments by regulatory agencies that the kinds of concerns raised by the public are not unique to incineration. Similar concerns have been raised for hazardous waste landfills, nuclear plants, and liquified natural gas terminals. Additionally, several commentors felt that EPA should provide a better picture to the public on national hazardous waste problems.

Companies:

- Companies unanimously felt that they have done as much or more than necessary to comply with all regulatory requirements. Additionally, many companies indicated that they had attempted to secure public support by engaging in a variety of activities. These included: holding public meetings to answer questions and discuss issues; distributing literature; keeping the press informed of significant activities; and giving tours (in cases of existing facilities).

- They felt that many of the public's concerns were more emotional than technical, and that the technical responses that companies can offer are not sufficient in dealing with emotional concerns. One company also commented that many persons seem either to be unaware of or to disbelieve factual information provided by EPA and the Coast Guard.

- Companies commented that there were a number of different "public agendas", and that it is very difficult to respond to them all.

- In many cases, companies felt that public opposition was not very widespread, but was centered among small, highly vocal segments of the public. They also felt that the media treated the issues in such a way as to sensationalize them, which fueled public opposition.

- One company asserted that in today's climate you can never hope to have no local opposition to the permitting of hazardous waste facilities. Given the reality that project sponsors will never be able to "win them all,"

the practical goal should be to persuade a majority of itizens that a project will be compatible with their ɔmmunity. This requires innovative steps to respond . citizens concerns, steps that often must go beyond the letter of the law.

° Finally, companies felt that the public needs a more accurate picture of national hazardous waste problems, and that the EPA should take the lead in providing better information to the public. Several companies felt that many public concerns are based on a lack of information by both citizens and local governments.

IV. KEY ISSUES AND CONCLUSIONS

Analysis of public concerns regarding incineration, and especially ocean incineration, have brought to light a number of key underlying issues that may have been acting as barriers to public acceptance of incineration as a waste treatment/disposal method. These issues are discussed below in some detail, followed by overall findings.

1. Issue: Dissatisfaction With The Public Hearing Process. At the point in the regulatory process when public hearings are conducted for both ocean and land-based incinerator permits, EPA officials typically discover that they have very different perspectives and specific concerns than those voiced by the public at such hearings. This has led to misunderstandings and citizens' dissatisfaction with public hearings and with the permitting process in general.

In hearings on proposed permits, the primary focus of the EPA staff is on compliance of the proposed permit with regulations and performance standards. This is because EPA officials accomplish their jobs of protecting the environment and human health through the diligent application of regulations and standards.

The public, on the other hand, is often concerned about broader or nontechnical issues, such as site selection, enforcement plans and capability, company credibility, and perceived health risks. Most of these issues are ones that either EPA believes were resolved prior to the proposed permit (e.g., that incineration is an environmentally sound technology), or that EPA has no jurisdiction over, such as the siting of land-based incinerators. Likewise, the incinerator company's past performance record, while of serious concern to EPA, does not preclude the granting of a permit as long as all conditions and requirements of the regulations are met.

Part of the problem is that each group has different expectations for public hearings on proposed permits. Federal and state regulatory agencies, and the company, expect to discuss technical issues, and are often perplexed by both the vehemence of public concern and the broad range of issues raised by citizens. Government regulatory officials have already carefully evaluated a company's proposal in terms of its adequacy in meeting technical and administrative requirements. Company officials, in turn, present technical studies to show that the proposed facility meets all regulations. In contrast, community opponents talk in terms of potential health risks, inequity of siting decisions, and adverse local

economic impact. When EPA and the state agency respond only to technical and permit-specific issues, the public perceives the regulatory agencies as being biased in favor of the company and being generally inflexible and unresponsive.

The perspective of regulatory agencies and most incinerator companies is that they are doing as much or more than is necessary to comply with what is required by law. They believe that through the public comment and hearing process, citizens are given a fair chance to voice concerns and be heard. Regulatory agency staff also claim, however, that they are not able to respond to concerns that are not technical in nature or that go beyond the scope of the regulations, and that full application of regulatory restrictions is not sufficient in dealing with citizens' general fears about toxic pollutants.

In the case of ocean incineration, EPA focused its discussion at public hearings primarily on the performance capabilities of the technology and on the risks and impacts at the ocean burn site. But the public was concerned about cradle-to-grave regulation, the potential health risks, environmental and economic impacts outside the burn site, and the ability of regulatory agencies to adequately enforce its regulations. This difference in scope of concerns reflects a lack of understanding by citizens that the scope of permit hearings is limited to the proposed permit, that technical requirements for an incinerator permit reflect underlying concerns for protecting health, and that other activities such as transportation are controlled by a different set of regulations.

2. Issue: Dissatisfaction With Siting Decisions. A number of issues relating to the siting of incineration facilities stand out as influencing public opposition. The siting process itself is a source of frustration. Comments from the public indicate that the siting process isn't clearly defined and that the public feels left out of siting decisions. They feel that criteria for selecting sites do not exist or are rudimentary at best. Certain aspects of any site seem to inevitably generate opposition, such as the transport route of waste to the site, the proximity of the site to schools, residential areas, or recreational areas, and the prior existence and impact of industries or hazardous waste facilities in the area. It should be noted, however, that solutions offered by the public to resolve siting problems were sometimes conflicting, for example some called for facilities to be spread out in order to minimize the burden on any one community while others called for the siting of centralized facilities.

EPA officials point out that they are being unfairly criticized by the public for siting decisions, since EPA has no authority over the selection of sites for land incinerators or port facilities. However, EPA does select ocean burn sites for incinerator ships.

One factor pervading all siting issues is the "not in my backyard" reaction. Many cases of opposition eventually boil down to simply not wanting an incineration facility nearby under any circumstances, even if incineration itself is thought to be an acceptable method of waste disposal. The underlying public concern here is the question of equity in the original siting decision: why should their community bear such a large share of the environmental costs of modern industry?

3. Issue: Lack of Credibility of Government and Industry. Regulatory agencies and companies are constantly judged by the public with regard to their credibility and the degree to which they act as providers of information. Public trust or distrust of regulatory agencies and companies strongly influences the acceptability of incineration regulatory programs in general, and the siting of individual facilities specifically.

State and federal regulatory agencies are judged by the public according to their past record in enforcement, permitting, monitoring, inspection capability, and cleanup activities. Public lack of understanding of agency policy, regulations, and permitting procedures also directly affects agency credibility. Information regarding incineration technology, potential health and environmental effects, and alternatives for hazardous waste management is of prime importance to the public.

Perhaps most of all, public opinion of regulatory agencies is influenced by the sense of whether the agency is dealing openly and honestly with the public, and acting in their best interests. One Alabama resident observed that state and federal agencies seem to depend too much on industry for direction, and to accept data from industry without many questions. The public also believes that there is a lack of sufficient federal and state resources to maintain and expand effective permitting, monitoring and enforcement programs. This view is based on publicized budget cuts at federal and state levels, and on public perception of an inadequate past record of regulatory agencies in these areas.

EPA's poor public image with opponents of ocean incineration largely resulted from their perception that the program was being managed in a very ad hoc manner. For land-based incineration EPA's credibility is a concern, but its relative importance varies from case to case and is not nearly so prominent an issue as in ocean incineration.

Companies intending to incinerate hazardous waste have come under intense public scrutiny. Their credibility is measured by their past experience in the community, their expertise in managing hazardous waste, and their past performance and safety record. In general, there is a very low

degree of public trust of incinerator companies. It is often felt that the companies do not provide the public with information that is accurate and readily available, thus creating the perception that the company is not dealing "openly" with the public. The public also believes there is significant involvement of organized crime in the hazardous waste industry.

4. Issue: Heightened Public Fears Regarding Hazardous Waste Disposal. There are basic fears by the public of any activity associated with hazardous waste, and according to citizens interviewed, there is a general lack of readily available public information on issues of hazardous waste management other than through the news media. One of the major findings of a 1979 study by EPA* is that there is a widespread increase in public opposition to the siting and operating of hazardous waste management facilities of any kind, and that this increase can be traced to the national publicity given to the hazardous waste problem. "This publicity," says the report, "is focused almost exclusively on the disastrous results of improper management of hazardous wastes. The public is therefore unable or unwilling to distinguish between patently improper sites for hazardous waste disposal...and properly managed disposal sites."

Public fears have been heightened by news of ocean oil spills, discoveries of illegal hazardous waste dumps, and contamination caused by leaking landfills and other shoddy hazardous waste disposal operations. These fears, which have been described by some companies as irrational or fears of the unknown, tend to act as a unifying force among much of the opposition.

5. Issue: Lack of Public Acceptability of Risks From Pollution. A related issue is that of the level of risk acceptable to the public. Risk assessments may show that risks from hazardous waste incineration do not pose a significant threat to the public and are considerably less than risks associated with common daily activities such as driving an automobile. However valid this may be, a segment of the public seems to be saying that any additional risks are unacceptable, especially when there is a probability, however minimal, of a catastrophic event occurring which could have a serious environmental, health or economic impact.

In addition, people seem to accept risk more readily if it is imposed voluntarily rather than involuntarily. Thus citizens tend to accept the risks of driving a car or smoking

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* "Siting of Hazardous Waste Management Facilities and Public Opposition," U.S. EPA, SW 809, November 1979.

cigarettes more easily than the risks of environmental pollution, even though the risks to health from driving cars is statistically higher than the risks from certain types of environmental pollution. In the case of incineration, the relatively low risks to health are not acceptable to some people because the risk-taking is perceived as not of their choosing and not under their control or influence.

The amount of risk "acceptable" to the public also varies according to the amount of perceived community benefit from the incinerator facility. With some exceptions, off-site commercial incinerator companies are generally unknown to the local community, or, if known, may be associated with problems at their facilities in other communities. In contrast to local manufacturing businesses, the community envisions few benefits from a proposed commercial incinerator facility: a few jobs and perhaps some tax revenues. In addition, potential risks are often seen as overwhelming: polluted air or water supplies threatening the entire community, decades of uncertainty, and hundreds of trucks carrying thousands of drums of hazardous waste on local roads. When local communities perceive the risks to be great and the benefits small, they tend to demand that the probability of something going wrong be low, or more often, nonexistent.

6. Issue: Need to Protect the Ocean as a "Public Resource". Many citizens view the ocean as a public resource that must be protected, rather than as a handy dumping area which is "out of sight, out of mind." In other words, the ocean is perceived to be everybody's backyard rather than nobody's backyard. Consequently, ocean incineration has gained the status of a national issue, and for some people even an international issue.

7. Issue: Need for Ocean Data. Because of some data gaps and assumptions relating to marine ecology and the potential impacts of ocean incineration, it is extremely difficult to convince the public that risk assessments, needs assessments, or worst case scenarios are valid. Any scientific assessment made that appears to support ocean incineration is likely to be refuted by other scientific authorities. In general, the public seems to have more certainty, and thus is more comfortable, regarding the impacts of and control over incineration on land than at sea.

8. Issue: Need for Intergovernmental Coordination. An issue raised specifically for ocean incineration is the need for better coordination regarding the siting of port facilities, the permitting for ocean burns, and the provision of public information. This is because ocean incineration involves several different agencies at each governmental level--federal, state and local.

9. Issue: Need for Link Between Ocean Incineration Regulation and a National Hazardous Waste Management Strategy. Another issue unique to ocean incineration is the request from citizens and state officials interviewed that EPA develop and/or communicate a national hazardous waste strategy that provides a framework for either promoting or abandoning ocean incineration as a viable and environmentally sound technology.

Overall Findings and Conclusions

The overall findings of this study of public concerns suggest that ocean incineration has given rise to a greater degree of public opposition than most land-based incinerator operations (either proposed or existing). This is primarily because the perceived impact of land-based incineration is very localized, whereas ocean incineration is felt by some citizens to potentially affect an entire region: the port community, all the communities along the coastline near the burn site, and the marine environment. However off-site, commercial operations on land, which have many characteristics in common with ocean incineration, have also received substantial opposition.

The findings also suggest that for land-based incineration, on-site facilities that directly serve a single waste generator have greater public acceptance than off-site, commercial facilities that serve multiple generators in a large market area. This is because people feel that off-site facilities do not provide sufficient economic benefits to the local community to offset the risks associated with importing wastes from other areas. On-site facilities are perceived as linked to businesses that are important to the local economy, and are generally not perceived as importers of hazardous waste.

Our basic conclusion is that EPA needs to better address the concerns of citizens regarding incineration by:

1. taking actions to ensure maximum protection of health and the environment; and

2. improving its public communications efforts and providing more visible leadership in the area of hazardous waste management.

Public opposition to incineration on both ocean and land may decline somewhat if EPA more fully addresses some citizen concerns regarding national regulatory strategy, local community impacts, equity of facility siting, public decision-making processes, and especially enforcement plans and capability. As one Alabama resident summed up: "If the present Administration

and Congress would provide the proper staffing and funding, and federal and state agencies would enforce existing regulations (such as penalizing illegal acts and jailing owners), then public confidence would change. Until it is shown that EPA and state agencies can and will do what is necessary to protect human health and the environment, then public opposition will continue."

Clearly many of the public's concerns are also EPA's concerns, such as the potential health and environmental impacts from incineration. But the Agency needs to better communicate how health and environmental concerns and priorities are reflected in the Agency's regulations and standards. Better communication of EPA's overall regulatory policy, strategy, and activities for hazardous waste management is crucial in providing a context for decisions on proposed permits for individual incinerator facilities or vessels. Better public communication is also important for improving EPA's credibility with the public, which is a necessary foundation for the effective accomplishment of the Agency's mission.

APPENDIX: KEY GROUPS AND GOVERNMENT OFFICIALS INVOLVED IN THE DEBATE OVER OCEAN INCINERATION PERMITS FOR CHEMICAL WASTE MANAGEMENT, INC.*

Local and State Citizen Organizations

Environmental Groups:

- Calcasieu League for Environmental Action Now (Louisiana)
- Frontier Audubon (Texas)
- Mobile Bay Audubon (Alabama)
- Alabama Sierra Club
- Texas Sierra Club

Civil Associations:

- Chickasaw Community Affairs Group
- Mobile League of Women Voters
- Texas League of Women Voters
- Alabama League of Women Voters
- Texas Rural Legal Aid (farmworkers)

Business Groups:

- Texas Shrimp Association
- Gulf Coast Fishermans Environmental Defense Fund

Coalitions:

- Coastal Environmental Alliance (business, civic, environmental groups)
- Gulf Coast Coalition for Public Health (fishing industry, resort industry, environmentalists)
- Texas Environmental Coalition (medical groups, environmental groups, labor unions, fishing industry)
- Valley Interfaith (religious groups)

Local and State Government Officials:

- City of Mobile (building inspector, city council)
- City of Chickasaw (city council)
- South Padre Island (city councilman/assistant major)
- State of Louisiana (attorney general)
- State of Texas (governor, attorney general)
- State of Alabama (attorney general, environmental agency)

National Environmental Groups

- National Wildlife Federation
- Greenpeace
- The Cousteau Society

Other Parties

- Land-based incinerator companies
- Chemical Waste Management, Inc.

* NOTE: Not all of these groups and individuals are opposed to ocean incineration or to proposed permits. For example, the National Wildlife Federation supports ocean incineration, while the Texas League of Women Voters has taken a neutral, educational role, being neither for nor against ocean incineration. But all parties listed here have been interested and involved in discussions of permits or regulations for ocean incineration.